



Formulation and Evaluation of Herbal Cough Syrup of Anacyclus Pyrethrum

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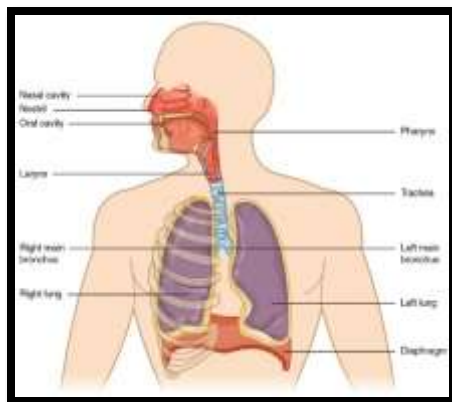
ABSTRACT:

Herbal remedies, such as Anacyclus pyrethrum (Akarkara), have gained attention for their potential efficacy in managing cough symptoms while offering a natural alternative to conventional medicines. This study aimed to formulate and evaluate a herbal cough syrup incorporating Anacyclus pyrethrum extract. The syrup was prepared using a standardized extraction process and formulated with excipients to optimize stability, viscosity, and palatability. Physicochemical characterization of the syrup indicated satisfactory pH, viscosity, density, and organoleptic properties. High-performance liquid chromatography (HPLC) analysis confirmed the presence of bioactive compounds, including alkylamides and polyacetylenes, in the Anacyclus pyrethrum extract. In vitro studies demonstrated the syrup's expectorant, bronchodilator, and anti-inflammatory activities, supporting its potential efficacy in relieving cough symptoms. Furthermore, stability studies revealed adequate shelf-life under recommended storage conditions. A sensory evaluation conducted among volunteers indicated overall acceptability of the herbal cough syrup, with positive feedback on taste, texture, and ease of administration. Overall, the formulation and evaluation of the Anacyclus pyrethrum herbal cough syrup suggest its potential as a safe and effective remedy for cough relief. Further clinical studies are warranted to validate its therapeutic benefits and establish its role in respiratory care.

KEY WORDS: Anacyclus pyrethrum, Herbal cough syrup, Formulation, Evaluation, Phytochemical analysis, Expectorant, Bronchodilator, Anti-inflammatory, Stability, Acceptability

INTRODUCTION:

Oral drug delivery systems are vital methods for administering medications, offering convenience, effectiveness, and versatility. Medications, in forms like tablets, capsules, liquids, or powders, undergo a series of processes in the gastrointestinal tract (GIT) before absorption into the bloodstream, facilitating therapeutic effects. Factors influencing their effectiveness include physicochemical properties, formulation, and patient factors like gastrointestinal motility and PH. Various formulations, such as immediate release (IR), delayed release (DR), and extended release (ER), are designed to control drug release rates and sites, enhancing absorption and patient compliance. Technologies like nanoparticle-based systems and targeted delivery further optimize efficacy and minimize side effects.

(Fig no.1: Respiratory system)

The function of oral drug delivery systems includes facilitating drug absorption, protecting drugs from degradation, controlling drug release, targeting specific sites in the gastrointestinal tract, masking unpleasant tastes, enhancing bioavailability, protecting gastrointestinal mucosa, and improving patient convenience and compliance. Anacyclus pyrethrum (Akarkara) herbal cough syrup works by thinning mucus, dilating bronchial tubes, reducing inflammation, and potentially fighting microbes. Herbal cough syrups, containing natural ingredients, may have fewer side effects and offer soothing relief. However, their effectiveness can vary, they lack standardization, and may not be suitable for all cough types.

Types of cough syrup: 1. Antitussive 2. Expectorant 3. Combination 4. Herbal 5. Children's 6. Alcohol-free 7. Sugar-free 8. Prescription

Objective:

ACTIVE INGREDIENTS USED IN COUGH SYRUP

1. Relieve cough symptoms
2. Soothe throat irritation
3. Loosen and expel mucus
4. Suppress excessive coughing
5. Boost immunity
6. Reduce inflammation
7. Utilize natural ingredients
8. Safe for all ages
9. Non-drowsy formula

(Fig no.2anacycluspyrethrum)



Taxonomical classification of anacyclus pyrethrum :

1. **Kingdom:** *plantae (Plants)*
2. **Phylum:** *Angiosperms (flowering plants)*
3. **Class:** *Magnoliopsida*
4. **Order:** *Asterales*
5. **Family:** *Asteraceae*
6. **Genus:** *Anacyclus*
7. **Species:** *pyrethrum*

Biological source: Anacyclus pyrethrum dry flowers are harvested from the flowering tops of the Anacyclus pyrethrum plant, native to North Africa and the Mediterranean. They're utilized in traditional medicine for their anti-inflammatory, analgesic, and aphrodisiac properties.

Chemical constituents of Anacyclus pyrethrum:

1. Pyrethrins: Natural insecticides with insecticidal properties.
2. Alkylamides: Responsible for medicinal properties like anti-inflammatory and analgesic effects.
3. Sesquiterpene lactones: Potential anti-inflammatory, antifungal, and cytotoxic compounds.
4. Polyacetylenes: Contributing to therapeutic effects such as antimicrobial and anti-inflammatory properties.
5. Volatile oils: Essential oils with aromatic properties and potential health benefits.

Traditional uses of Anacyclus pyrethrum:

1. Digestive Disorders: Alleviates issues like indigestion and bloating.
2. Dental Health: Relieves toothaches and treats gum diseases.
3. Aphrodisiac: Enhances libido and sexual performance.
4. Respiratory Ailments: Treats asthma, bronchitis, and coughs.
5. Rheumatism and Arthritis: Alleviates symptoms due to anti-inflammatory effects.
6. Skin Disorders: Treats eczema, dermatitis, and wounds.
7. Stimulant: Improves energy levels and combats fatigue.

Material and methods :

Sr.No	Name of ingredients	properties
1	Anacyclus pyrethrum	Anticough
2	Tulsi	Antitussive
3	Ginger	Antitussive
4	Honey	Preservative
5	Clove	expectorant
6	Cardamom	Flavoring agent.
7	Adulsa	Antitussive
8	Liquorice	expectorant

(Table No.1: Ingredients)*(Fig No.3: Ingredient)***B) Method of preparation****1. Method of Extraction****2. Formulation Table****3. Formulation of Syrup****1. Method of Extraction:**

- Take 4-5 gm of each herbal ingredients.
- Herbs was mixed using 100ml of water.
- Connect the reflux condenser and gently heat the mixture using a water bath for 3 hours.
- Continue heating until the volume reduces to one-quarter of its original amount. Then liquid was cooled and filtered.

2. Formulation table :

SR.NO	F1	F2	F3
1. Anacyclus pyrethrum	4 ml	4 ml	4 ml

2. Tulsi	4 ml	5 ml	5 ml
3. Ginger	3 ml	4 ml	2 ml
4. Liquorice	4 ml	5 ml	3 ml
5. Cardamom	2 ml	2 ml	4 ml
6. Clove	4 ml	3 ml	4 ml
7. Adulsa	6 ml	5 ml	5 ml
8. Honey	3 ml	2 ml	3 ml

(Table No.2: Formulation Table)

3. Formulation of Herbal cough Syrup.

1. Simmer a mixture of chopped Anacyclus pyrethrum (Akarkara), Liquorice (Mulethi), Ginger, Adulsa (Adhatoda vasica), Tulsi (Holy Basil), Clove, and Cardamom in water for 20-30 minutes.
2. Separate the liquid and dispose of the solids.
3. Mix honey into the strained liquid to taste and dissolve it completely.
4. Let the syrup cool and transfer it to a clean glass jar or bottle.
5. Label the container with the date and ingredients.
6. Store the syrup in the refrigerator for up to a few weeks.
7. Shake well before each use.

RESULT AND DISCUSSION :**1. Formulation evaluation parameter:**

SR. NO	TEST	PROCEDURE
1.	Odour Examination	<ol style="list-style-type: none"> 1. 2ml of prepared syrup was taken and smelled by each individually formulated syrup. 2. The time interval between 2 smelling was 2 min and check previous smelling effect syrup.
2.	Colour Examination	<ol style="list-style-type: none"> 1. A volume of 5ml of the prepared syrup was dispensed onto a watch glass. 2. The watch glass was positioned against a white background under a fluorescent tube light. 3. The coloration was visually assessed without the aid of any optical devices.
3.	Taste Examination	<ol style="list-style-type: none"> 1. A smidgen of the final syrup was taken and assessed on the taste buds of the tongue.

4.	PH Determination	<p>1. A volume of 10 ml of prepared syrup was dispensed into a 100 ml volumetric flask.</p> <p>2. The flask was then filled to the mark with distilled water to achieve a total volume of 100 ml.</p> <p>3. The solution was subjected to sonication for a duration of 10 minutes.</p> <p>4. The pH of the solution was determined using a digital pH meter.</p>
5.	Viscosity Determination	<p>1. The viscosity of each formulation was evaluated using an Ostwald's U-tube viscometer.</p>

2. Evaluation test of cough syrup:

Formulation	A)Color	B)odor	C)Taste
F1	Yellowish-Brown	Sweet aromatic	Sweet
F2	Yellowish-Brown	Aromatic	Pungent
F3	Yellowish-Brown	pleasant	Bitter

(Table No.3: Evaluation of cough syrup)

D) pH: The pH of solutions A, B, and C falls within the range of 3 to 6, indicating their acidic nature, and they exhibit a yellow colour.



(Fig No.4: pH)

E) Viscosity:

- 1) Cleaned the Ostwald viscometer with warm chromic acid and subsequently utilized an organic solvent such as acetone.
- 2) Positioned the viscometer in a vertical orientation on a suitable stand.
- 3) Filled the viscometer with water up to the G mark after ensuring it was dry.
- 4) Timed the flow of water from mark A to mark B in seconds.
- 5) Repeated this step at least three times to obtain accurate readings.
- 6) Washed the viscometer with the sample liquid and filled it up to mark A, then recorded the time required for the liquid to flow to mark B.

Formula for viscosity: $\text{Viscosity} = \frac{\text{Density of the test liquid} \times \text{time required for test liquid to flow}}{(\text{Density of water} \times \text{time required for water to flow})} \times 100$

Range F1: 112 sec, F2: 110 sec, F3: 99sec



(Fig No.5: Formulated herbal cough syrup)

CONCLUSION:

The preformulation studies for all three formulations met the specified criteria. Additionally, the physicochemical attributes of the prepared syrup, such as colour, odor, pH, and taste, were found to be satisfactory. Among the three formulations, one stood out as it met all specifications, including the appropriate concentration of honey as per IP standards and effective preservative usage. This study contributes to the development of an efficacious and safe herbal cough syrup, utilizing a base comprising 40% W/V honey.

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